

1 **DIALING DEVICE FOR A CELL PHONE USED IN A VEHICLE**

2 **BACKGROUND OF THE INVENTION**

3 **1. Field of the Invention**

4 The present invention relates to a dialing device, and more particularly
5 to a dialing device that allows a driver of a vehicle to dial the cell phone in the
6 vehicle by handwriting.

7 **2. Description of Related Art**

8 In order to prevent possible traffic accidents resulting from the use of
9 cell phones when people are driving, a preferable way to dial a number on a cell
10 phone is accomplished by speech recognition dialing. When people attempt to
11 call someone while driving, the call can be easily initiated just by speaking the
12 name of the person to be called. The cell phone will recognize the spoken name,
13 locate the name and number in its memory and automatically dial the correct
14 number. However, the aforementioned way still has some problems as follow.

15 1. Limited by the storage capacity in the cell phone, the recordable
16 amount of the numbers is also limited.

17 2. It is common for a lot of background noise, such as engine sound, to
18 exist in a vehicle so when people are dialing the accuracy of voice recognition
19 may be impaired and thus the attempt to make the call might fail.

20 3. The human voice may have a temporary hoarseness and differ from
21 the usual tone, especially when a person has an inflammation in the throat or has
22 caught a cold.

23 Another way to dial is through the use of a touch-panel or a handwriting
24 panel. The driver only needs to write down the phone number on the panel. Since

1 written numerals can be easily recognized, it is easy to achieve a successful call.
2 However, when writing the number on the panel, it is necessary to lower the head
3 when writing so as to check if the written number is correct and this may result in
4 a possible accident.

5 **SUMMARY OF THE INVENTION**

6 The main objective of the present invention is to provide a dialing device
7 that allows the driver to safely dial a telephone call by handwriting the
8 appropriate number while the driver is driving the vehicle.

9 Other objects, advantages and novel features of the invention will
10 become more apparent from the following detailed description when taken in
11 conjunction with the accompanying drawings.

12 **BRIEF DESCRIPTION OF THE DRAWINGS**

13 Fig. 1 is a block diagram of a dialing device in accordance with the
14 present invention;

15 Fig. 2 shows a schematic image that is projected on a windshield of a car
16 in accordance with the present invention;

17 Fig. 3 is an operational view of the dialing device of the present
18 invention; and

19 Fig. 4 is another operational view of the dialing device of the present
20 invention.

21 **DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT**

22 With reference to Fig. 1, a dialing device in accordance with the present
23 invention mainly includes a handwriting device (10), a control unit (20), a
24 miniature projector (30), a dialing apparatus (40) and a connecting interface

1 (21).

2 The handwriting device (10) is provided to receive a written number
3 from a user or driver, wherein the handwriting device (10) may be performed by
4 a touch type panel or a handwriting panel.. The touch type panel is used in the
5 embodiment hereinafter.

6 The control unit (20) has a penmanship recognition system fitted inside.
7 The penmanship recognition system is able to identify characters or numbers
8 written on the handwriting device.

9 The miniature projector (30) connected to the control unit (20) can
10 generate and project an image on a windshield of a vehicle such as a car. The
11 projected image is illustrated in Fig. 2. The image is composed of several regions,
12 which include a written text display region (31) showing all texts written by the
13 driver, a confirmation region (32) showing the recognized text result, and a
14 plurality of function keys (33). The function keys (33), for example, include
15 “confirmed”, “delete”, “dial”, “switch” and “store”. The explanation for these
16 function keys (33) will be disclosed in detail later.

17 Still referring to Fig. 1, the dialing apparatus (40) serves as an interface
18 between the control unit (20) and a cell phone. After the driver confirms the
19 number displayed on the image is correct, the driver dials the confirmed number
20 on the cell phone through the dialing apparatus (40).

21 The connecting interface (21) is for connection between the control unit
22 (20) and an electrical apparatus such as a personal digital assistance (PDA) (50)
23 or a notebook computer. Therefore, data can be downloaded from or uploaded to
24 that electrical apparatus. It is noted that the connecting interface (21) is either a

1 wire-connected type or a wireless type. If the connection interface (21) is a
2 wire-connected type interface, it may be a USB, an RS232 port etc. Otherwise,
3 the wireless type for the connecting interface (21) may be an infrared port or a
4 Bluetooth™ transmission port.

5 From the above description, the basic configuration and function of the
6 invention are disclosed. In the following disclosure, the detail operation and
7 function for each element will become more clear when taken in conjunction
8 with the accompanying drawings.

9 The touch-type handwriting device (10) has sensing ability to receive
10 the written text. The written text to be recognized is then transmitted to the
11 control unit (21). Since the present handwriting recognition technology has
12 become well developed, it is easy to acquire a high recognition accuracy.
13 Moreover, when the control unit (20) achieves a connection to the PDA (50)
14 through the connection interface (21), the data stored in the PDA (50) is also
15 accessible by using the handwriting device (10).

16 When the control unit (20) detects hand-written data from the
17 handwriting device (10), all the detected written data is projected as an image on
18 the windshield of the car. At the same time, the hand-written data will be
19 compared to the existing words stored in the control unit (20) thus finding the
20 most similar characters. In the same way as the well known handwriting system,
21 the control unit (20) possesses a self-learning ability, which memorizes the
22 user's particular script and enables the control unit (20) to achieve high
23 recognition accuracy within a short term.

24 The control unit (20) not only can recognize numbers, but also can

1 identify characters such as letters so that if the written data is a name of a person
2 to be called, the control unit (20) still can recognize that name and locate a
3 corresponding number to be dialed.

4 The projected image display on the windshield from the miniature
5 projector (30) provides a checking function for the user to verify whether the
6 recognized result is correct. As mentioned above, two regions (31) (32)
7 respectively display the written text and the recognized result. If the recognized
8 data on the confirmation region (32) is correct, the user can move a cursor of the
9 handwriting device (10) to the function key “confirmed” and perform actuation
10 at that position. When the function “confirmed” is actuated, the text on the
11 confirmation region (32) is accepted. Otherwise, if the data displayed on the
12 confirmation region (32) is wrong, the incorrect word can be deleted just by
13 actuating the “delete” function key. After all the numerals have been correctly
14 recognized, the driver actuates the “dial” function to instruct the control unit (20)
15 to dial the designated number through the dialing apparatus (40).

16 The driver may suddenly attempt to record some information during
17 driving. In this situation, the driver can utilize the handwriting device (20) to
18 write down desired information. When the “store” function key is actuated, this
19 written information can be selectively stored in the control unit (20) or sent to the
20 PDA (50) connected to the control unit (20).

21 The driver is able to operate the PDA (50) by actuating the “switch”
22 function key. At the same time, the image on the windshield from the miniature
23 projector (30) is the same as that on the display screen of the PDA (50).

24 When the “dial” key is actuated, the control unit (20) dials the confirmed

1 number through the dialing apparatus (40) to which the cell phone is connected.

2 When the dialing device of the present invention is fitted in the car, the
3 handwriting device (10) and the control unit (20) are integrated into the
4 dashboard (60) as shown in Fig. 3, or disposed near the hand brake (61) or the
5 gear stick as shown in Fig. 4. The miniature projector (30) can be mounted on the
6 dashboard (60) or to the ceiling. Since the projected image only occupies a small
7 region of the windshield, there is no obstruction to the driver's field of view.

8 Moreover, by updating the program in the control unit (20), the display
9 mode may have more auxiliary functions. For example, for a vehicle equipped
10 with a display monitor, the video signal output from the control unit (20) can
11 directly displayed on that monitor.

12 It is to be understood, however, that even though numerous
13 characteristics and advantages of the present invention have been set forth in the
14 foregoing description, together with details of the structure and function of the
15 invention, the disclosure is illustrative only, and changes may be made in detail,
16 especially in matters of shape, size, and arrangement of parts within the
17 principles of the invention to the full extent indicated by the broad general
18 meaning of the terms in which the appended claims are expressed.